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FUTURES GROUP GLASTONBURY CT  
A STUDY TO DETERMINE THE EVOLUTION OF ADVANCES IN MEDICAL TECHN=ETC(U)  
MAY 80 T J GORDON, L MASON, H TRUITT  
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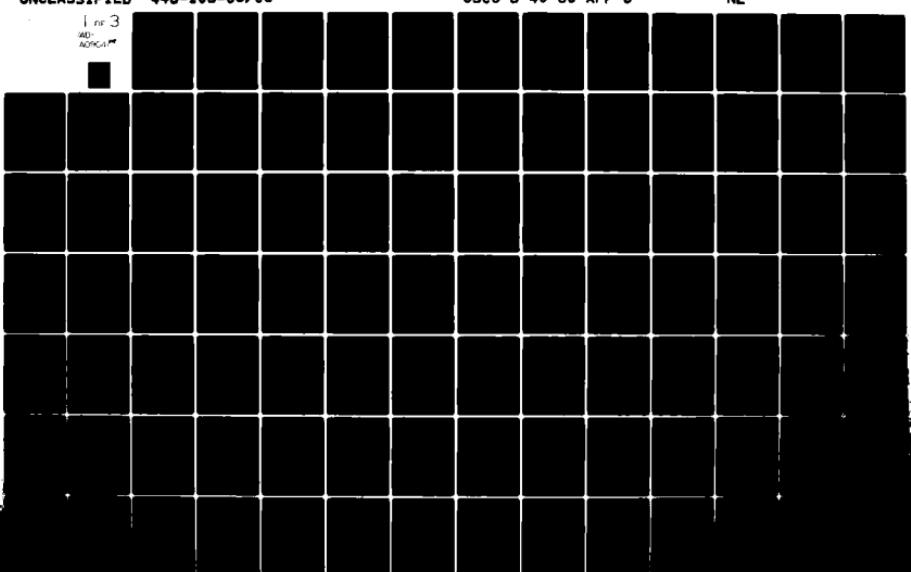
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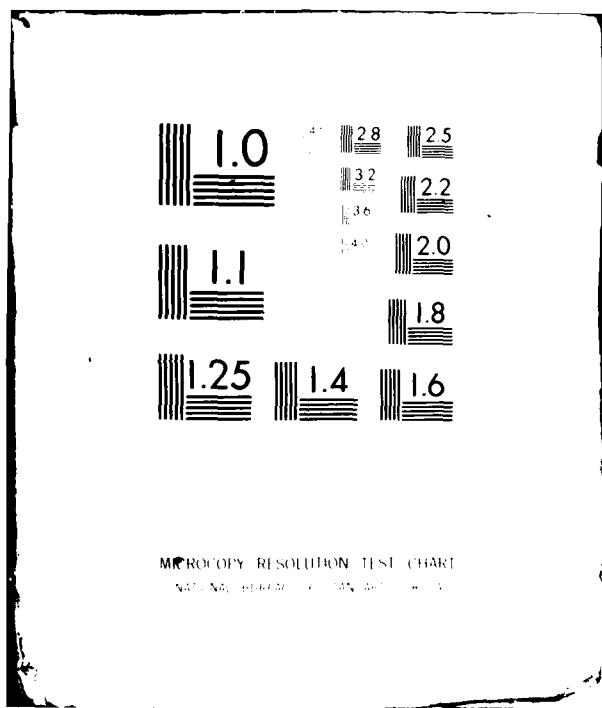
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APPENDIX D.

LITERATURE SEARCH OF FORECASTS RELEVANT TO MEDICAL TECHNOLOGIES.

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## PREFACE

This document contains a series of forecasts of medical technologies derived from an extensive literature search. These forecasts are not offered as being "correct" but rather as a summary of developments expected by others in the field. In each instance, bibliographic references have been provided so that the original article can be reviewed later, if desirable.

In order to organize this material, medical technologies have been divided into five major categories: diagnostic, preventive, therapeutic or rehabilitative, organizational, and supportive (e.g., nursing care). Within each of these major categories, the forecasts have been subgrouped under techniques, drugs, equipment, and procedures.

We expect that other forecasts will be added from time to time as the study progresses and that, through a system of scoring which recognizes relevance to Coast Guard missions, probability, timing, and other factors, this set of forecasts will be distilled and refined to a smaller, more focused subset.

**A. DIAGNOSTIC**

**1. Techniques**

Forecast: Brain or cerebrovascular disease diagnosis by energy or work output analysis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Availability of a simple test to measure glycosated hemoglobin levels to allow better regulation of hyperglycemia in diabetes.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "Blood Test May Start New Era in Diabetes Therapy Evaluation," Journal of the American Medical Association, Vo. 237, No. 9 (February 28, 1977), pp. 847-848.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Widespread availability and use of a blood test to detect congenital hypothyroidism (e.g., measuring levels of serum thyrotropin, measuring levels of thyroid - stimulating hormone).

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1983

Assumptions:

Probability: High

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "Pittsburgh Doctors Develop Test Which Can Detect Hypothyroidism," News and Features from NIH (February 1977), pp. 23-25.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Simple, routine, non-extractive assay for tricyclic plasma concentrations is available.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: Alerne, G.W., et.al., "Letter: Radioimmunoassay for Nortriptyline and Amitriptyline," The Lancet, No. 8023 (June 4, 1977), p. 1214.

Subject: Medicine - Biomedicine

Related Subjects: Drugs, Biology

Forecast: Cardiovascular disease diagnosis by energy or work output analysis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Brain or cerebrovascular disease diagnosis by chemical analysis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Chemistry, Biology

Forecast: The greatest advances in medicine involved biochemical and metabolic discoveries at the cellular level during the period 1977-2001.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2001

Assumptions:

Probability: High

Method: Intuitive single individual expert in field

Source: Ben D. McCallister

Reference: "Midwest Research INstitute: Focus on 2001," Technology Forecasts and Technology Surveys, Vol. 9, No. 10 (October 1977), pp. 1-3.

Subject: Medicine - Biomedicine

Related Subjects:

Speakers Expect Many Changes by 2001

Speakers at a special lecture series on the Midwest in 2001 forecast changes in population, medicine, and telecommunications. Garland R. Hadley, executive vice-president of Kent Foundation, stated that he expects the population of the Midcontinent region to grow more rapidly than the national population. He noted that productivity must increase faster than the population if we are to enjoy a rising standard of living. He concluded that "we may actually be entering a period in which further mechanization is no longer necessary for survival, but instead one in which technology becomes a neutral force. Thus we may be creating an environment conducive to the creation of small businesses and greater diversity in products and services." Ben D. McCallister, a cardiologist, predicted that the greatest advances in medicine from now until 2001 will involve biochemical and metabolic discoveries at the cellular level. He stated that artificial hearts may be developed by 2001, but that developments in heart transplants will reduce their importance. McCallister also forecasts construction of more specialized care centers and increased use of nurse clinicians and paramedics, in order to contain health care costs. Robert Gaynor, vice-president and general manager of AT&T Long Lines, predicted that computers will be invaluable business aids. For example, workers will be able to retrieve information from central data banks to help in decision making and will use computers to test the impact of various decisions. In discussing these and other advances in telecommunications, Gaynor explained that "the technology underlying these concepts exists today. They will be introduced as soon as the demand is there, when the marketplace is willing to pay for them."

Keywords: Computers, Demography, Medical care,

Telecommunications

Sources: Tech & Techn S. 10/77, pp. 1-3

Serial No.: 6197

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Forecast: Understanding the genetics of dominant inherited diseases on a cellular or chemical basis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Kurt Hirschhorn, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: In vitro tests to permit specific chemotherapy or immunotherapy for neoplastic disorders of the gastrointestinal tract

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Kurt J. Isselbacher, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Routine analysis of all body fluids and functions with corresponding diagnostic reports as part of medical care in North America develops between the years 1980 to 1994.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1994

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Canadian Medical Association Journal, 12/31/75, p. 1076.  
SCOUT Source Code 8475

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of a simple, inexpensive, and rapid blood test to predict predisposition to peptic ulcer.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Probability: High

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "A Peptic-Ulcer Test," Medical World News, Vol. 17, No. 3 (February 9, 1976), p. 9.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Widespread availability of reliable carcino-embryonic antigen tests.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Probability: Medium

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "The Makari Test: Successful Detection of Cancer," Scrip, No. 207 (May 29, 1976), p. 15.

Subject: Medicine - Biomedicine

Related Subjects: Drugs

A. DIAGNOSTIC

2. Drugs

Forecast: Highly effective and less toxic antineoplastic drugs

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Alfred Gilman, Ph.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 59

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Indium 111 is used increasingly to find thromboses in patients.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1983

Assumptions:

Probability: High

Method: Intuitive single individual expert in field.

Source: Dr. Martin J. Lipton

Reference: "Pinpointing Thromboses By Radioisotope Scan," Medical World News, Vol. 19, No. 1 (January 9, 1978), p. 54.

Subject: Medicine - Biomedicine

Related Subjects:

Radioisotope Scan Used To Find Thromboses

A California radiologist is using indium 111 to find thromboses in patients. He says the technique is useful and will be increasingly used over the next 4 or 5 years.

Keywords: Medical research

Source: Med W News, 1/9/78, p. 54

Serial No.: 7205

Forecast: Development of reliable chemical tests for psychotic disorders

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 275

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

A. DIAGNOSTIC

3. Equipment

Forecast: Medical applications of diagnostic ultrasonic in the U.S. equal those of x-rays.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1987

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: "Diagnostic Ultrasound Cuts Production of Antibodies," Medical World (May 16, 1977), p. 28.

Subject: Technology

Related Subjects: Medicine - Biomedicine

Ultrasound Diagnosis May Be More Common Than X-Rays in 10 Years

Some clinicians predict that medical use of diagnostic ultrasound in the US will equal or even surpass that of x-rays within 10 years. However, researchers at the University of Missouri are warning the medical profession to be cautious about this increasingly popular diagnostic aid. Based on experiments in which mouse spleens were exposed to ultrasound, the researchers have concluded that ultrasound has an immunosuppressive effect on certain classes of antibodies. If ultrasound proves to be an immunosuppressant in humans, it could be beneficial in organ transplants, some types of cancer, and auto-immune diseases. It is also possible that a limited exposure to vital organs or immune tissues for diagnostic purposes may avoid any adverse effects. Other researchers have shown that diagnostic levels of ultrasound are capable of damaging chromosomes of lymphocytes or interfering with cell mitosis.

Keywords: Medical equipment  
Source: Med W News, 5/16/77, p. 28  
Serial No.: 3731

Forecast: Computer use in patient monitoring systems climbs by one third during the period 1977-1986.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1986

Assumptions:

Probability: High

Method: Trend forecast mathematical extrapolation

Source:

Reference: "Frost & Sullivan Reports on Patient Monitoring Equipment," Surgical Business, Vol. 40, No. 5 (May 1977), p. 24.

Subject: Health, Health Care & Mental Health

Related Subjects: Medicine - Biomedicine

Hospital Patient Monitoring Equipment Market  
Forecast To Reach \$370 Million by 1986

A new study by market research specialists Frost & Sullivan, Inc. predicts a market of \$370 million by 1986 for hospital patient monitoring equipment (1975 = \$215 million). Fetal and neonatal monitoring is a big new growth market. The present controversial practice of computer use in patient monitoring systems will climb by one-third over the next 10 years. Other trends the report spotlights include increasing use of central station systems, particularly in larger hospitals, and an "all monitored beds" concept in new hospitals whereby all beds are wired to accommodate mobile bedside monitors that can be rolled away when not in use.

Keywords: Hospitals, Medical equipment

Source: Surg Bus. 5/77, p. 24

Serial No.: 1724

compiled and published

Forecast: Malignant neoplasm diagnosis by internal probes

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Widespread availability and use of electroacoustic impedance bridge to provide objective assessments of middle ear functions.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: Paradise, Jack L., "Testing for Otitis Media: Diagnosis Ex Machina," The New England Journal of Medicine, Vol. 296, No. 8 (February 24, 1977), pp. 445-447.

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Cardiovascular disease diagnosis by transmission or reflection analysis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Brain or cerebrovascular disease diagnosis by transmission or reflection analysis

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Instrumentation for home use with information relayed by telephone or telemetry to physician base for analysis with treatment prescribed by phone

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Jacob Kline, Ph.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Flow cytometry is as important in research and clinical medicine as the scintillation counter or the Autoanalyzer.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1989

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Horan, Paul K. and Leon L. Wheless, Jr., "Quantitative Single Cell Analysis and Sorting," Science, Vol. 198 (October 14, 1977), pp. 149-157.

Subject: Medicine - Biomedicine

Related Subjects:

### Flow Cytometers and Sorters Emerge as Important New Technology in Research and Medicine

Flow cytometers and sorters are enabling scientists to perform rapid analysis and sorting of cells. This new technology is becoming extremely important in biomedical research and clinical medicine. Flow cytometry allows doctors to look at the delivery of anti-cancer agents which can vary among patients. In the future scientists believe that flow cytometry will provide a method "for genetic analysis of the unborn fetus." Flow cytometers and sorters also have potential as components of larger systems in such things as cancer screening or cell classification instruments. There is speculation that by the end of the 1980s "flow cytometry may be as important in research and clinical medicine as the scintillation counter or the Autoanalyzer."

Keywords: Medical research

Source: Science, 10/14/77, pp. 149-157

Serial No.: 5920

Forecast: Brain or cerebrovascular disease diagnosis by internal probes

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Physiologic monitoring of all patients in hospital, probably by telemetry

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Arthur C. Guyton, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977) p. 59

Subject: Medicine - Biomedicine

Related Subjects: Physiology

Forecast: Automation and electronic processing expansion, particularly in micro-biology, cytology, hematology, and chemistry

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: John B. Henry, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 58

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Computers used to make consultation available to primary care physicians

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Robert E. Rakel, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Ultrasound imaging grows rapidly during the period 1978-1983, however a shakeout occurs.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1983

Assumptions:

Probability: Medium

Method: Trend forecast mathematical extrapolation

Source:

Reference: "See 50 Percent Attrition by 1980 in CT, Imaging Suppliers," Electronic News (March 13, 1978), p. 88.

Subject: Medicine - Biomedicine

Related Subjects:

50% Attrition Predicted for  
CT Scanner Suppliers by 1980

A study by Creative Strategies Inc anticipates a shakeout in the CT scanner and ultrasound imaging fields by 1980. Of the 15 US CT scanner suppliers, Creative Strategies predicts 6 will have disappeared (either through going out of business or via acquisition) by 1980. The study, entitled Medical Diagnostic Imaging, predicts that sales of diagnostic imaging equipment will flatten at approximately \$1 billion by 1982. Ultrasound imaging, with rapid growth predicted for the next 5 years, is, nevertheless, also expected to undergo a shakeout, the study forecasts.

Keywords: Medical equipment

Source: Elec N, 3/13/78, p. 88

Serial No.: 7825

Forecast: Availability of an ultrasonic moving picture scanner which allows physicians to observe a cross-section of the beating heart.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "Watching Heart Beats," New Scientist, Vol. 66, No. 950 (May 22, 1975), p. 448.

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Special risk groups in North America such as heart and diabetes patients carry computer-monitored radio transmitting devices to warn of change in body functions.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Canadian Medical Association Journal, 12/13/75, p. 1076.  
SCOUT Source Code 8475

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Special risk groups such as heart and diabetes patients carry computer-monitored radio transmitting devices to warn of body function changes.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "Ambulatory Electrocardiography for Diagnosis and Treatment of Cardiac Arrhythmias," The New England Journal of Medicine, Vol. 294, No. 7 (February 12, 1976), pp. 373-380.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Widespread availability of computer-aided x-ray machine that allows physicians to view arteries.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "Diagnostic Instrument for Arteriosclerosis Developed," Surgical Business, Vo. 39, No. 2 (February 1976), pp. 14-15.

Subject: Medicine - Biomedicine

Related Subjects: Technology

Forecast: Extensive use of interactive television to monitor aged within their homes.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 279.

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control; Health, Health Care & Mental Health

B. PREVENTIVE

1. Techniques

Forecast: Control of aging by control of self-recognition

Subforecasts: Bone marrow grafts or hormones rejuvenate the immune system

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging and Aging Control

Forecast: Control of aging of the endocrine system

Subforecasts: Retards death due to diseases associated with endocrine dysfunction.

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology; Aging & Aging Control

Forecast: Control of aging by control of hormones that induce aging

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Control of aging by control of free radical formation

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technolgov Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Control of aging by control of cross-linkage

Subforecasts: Many cross-linkages in collagen are free radical reactions

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Control of aging by control of brain mass

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions: Knowledge of central nervous system and endocrine control systems basic to intervention to slow aging

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Control of aging of the heart or circulatory system

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Cardiovascular disease prevention by control of involuntary functions

Subforecasts: Biofeedback to train more efficient, effective use of the autonomic nervous system to achieve more, better rest

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects: Biology, Physiology

Forecast: Control of aging by control of a bioneural clock, death instinct, or central nervous system instructions to the body to age

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions: Knowledge of central nervous system and endocrine control systems basic to intervention to slow aging

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Brain or cerebrovascular disease prevention by genetic means

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

Forecast: Brain or cerebrovascular disease prevention by immunological means

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Cardiovascular disease prevention by lifestyle control

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions: Will require education

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Control of aging by control of foreign protein rejection

Subforecasts: Possibility of bone marrow grafts or endocrine intervention

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: High

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Age & Aging Control

Forecast: Control of aging process by control of the diet

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: High

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Brain or cerebrovascular disease prevention by lifestyle control

Subforecasts: Most effect on death rates in lower age groups

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions: Requires funds for education and promotion

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Immunological control of aging

Subforecasts: Ameliorates auto-immune disease

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Cardiovascular disease prevention by immunological means

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Discovery of the main causes and prevention of diabetes

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Robert H. Williams, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Marked reduction in the incidence of coronary artery disease by massive lowering of the circulating blood lipid concentration

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Eugene Braunwald, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: There is a change to more preventative medicine, and programs stress diet and behavior during the period 1980-1990.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Trend forecast intuitive extrapolation

Source:

Reference: "America's Doctors; A Profession in Trouble," U.S. News & World Report (October 17, 1977), pp. 50ff.

Subject: Health, Health Care & Mental Health

Related Subjects: Medicine - Biomedicine

Medical Profession Seen Changing Over Next Decade

A US News & World Report special report suggests that the next few years will be critical to the future of the US medical profession. The highest doctor patient ratio, since the turn of the century, 1 to 490, will exist in 1980. According to estimates by government officials, physicians will earn an average of \$75,000 annually by 1978. More than 31 million Americans will be over 65 by the year 2000; they will require 2.5 times as much health care as younger citizens and specialties are not geared to meet the demand. High costs, technology, quality, and the conflict of the individual versus society are problem areas requiring some solution in the future. HEW Secretary Califano identifies high cost as the "overarching problem": expenditures will double by 1980; hospital costs for medicare and medicaid will double sooner, hospital costs could reach \$220 billion by 1985; health costs are increasing 1.5 times the cost of living increase. Health officials and physicians identify the following trends over next decade: public scrutiny and efforts to unionize doctors will further chip at the medical "mystique"; the AMA will be the bargaining agent between doctors and government; medical economics will change, the FTC will challenge the current laissez-faire approach; greater use of paraprofessionals; less specialization; and a change to more preventive medicine programs that stress diet and behavior.

Keywords: Health care costs, Medicaid care,

Physicians

Sources: US News, 10/17/77, pp. 50ff

Serial No.: 5869

Forecast: Span-extending technologies increases lifespan by affecting the basic aging process.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Theodore Gordon

Reference: "Large Market Future for Conservation-Oriented Products and Services," Technology Forecasts & Technology Surveys, Vol. 9, No. 6 (June 1977), pp. 1-3.

Subject: Health, Health Care & Mental Health

Related Subjects:

**TFG President Predicts Mid-1980s Will Be Era of "Conspicuous Conservation"**

In the mid-1980s lifestyles in industrialized nations will be shaped by 4 key forces: the drive for conservation; inflation, changing incomes, and shifting demography; new technologies; and general acceptance of new values. This analysis of the not-too-distant future was recently presented to a Conference Board meeting by Theodore J. Gordon, president of The Futures Group. Gordon predicts that reducing energy consumption will result in decreased mobility, transition to electricity (including electric vehicles) and renewed emphasis on mass transit. Although the exact economic effect of the energy problem is uncertain, Gordon suggests that the mid-1980s will be an era of "conspicuous conservation." Perceptions about what constitutes the "good life" will change and views of what is desirable to consume will be altered. On the average, households will probably have more money to spend but there will be some basic shifts in the composition of spending units. Gordon anticipates that more emphasis will be placed on family and social problems and interests; inflation will lead to diminished incomes and more conservative lifestyles; some "necessities" will become luxuries; and the rate of formation of single-person households will decline because multiple-wage-earner households will enjoy economic advantages. Advanced electronics and medicine are 2 technologies that will have significant impacts on the future. Among the electronic advances will be household computers, smart machines or robots, electronic braking systems for cars, and interactive, 2-way TV games. In medicine, progress will be made in both disease curing and life extending technologies. All changes will be accompanied by intensified desires for entitlement and security.

*Keywords: Energy conservation, Lifestyles, Technology*

*Source: Tech F & Tech S. 6/77. pp. 1-3*

*Serial No.: 4473*

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Forecast: Control of aging by control of body temperature

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Control of lung aging

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Brain or cerebrovascular disease prevention by control of involuntary functions

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Control of aging by control of somatic cell mutations or replication noise

Subforecasts:

Year Forecast Made: 1977

Year Of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Interruption of carcinogenic process in high-risk individuals

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Emmanuel Farber, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 58

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: New knowledge of the pathogenesis of bacterial and viral diseases leads to effective prevention and treatment

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: A. McGehee Harvey, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Application of revolutionary advances in the basic sciences to the cause and prevention of mental illness, nephritis, degenerative vascular disease, arthritis, and cancer leads to important breakthroughs

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: A. McGehee Harvey, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Average U.S. life expectancy 95 years old with commensurate prolongation of vigor.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2015

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: Ability to control aging process permitting significant extension of life span

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1993 - Bender and others  
2023 - Helmer and Gordon  
2017 - Smith, Kline, and French Laboratories

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source:

Reference: American Hospital Association, Hospitals in the 1980s (Waukegan, IL: Visual Images, Inc., 1977).

Subject: Medicine - Biomedicine

Related Subjects: Aging & Aging Control

Forecast: In utero genetic modification

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2025

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 282.

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

B. PREVENTIVE

2. Drugs

PRESERVE IN THE DARK-CT FILM

Forecast: Availability of proxibarbal or similar agent to prevent allergic reactions.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Sulman, F. A., "Letter: Prevention of Allergy by Enzymes Induction," The Lancet, No. 8023 (June 4, 1977), pp. 1206-1207.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Prevention of brain or cerebrovascular disease by pharmacological means

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: High

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Health & Health Care; Drugs; Aging & Aging Control

Forecast: Prevention of cardiovascular disease by pharmacological means

Subforecasts: Prophylaxis could eliminate asymptomatic hypertension, at least in the younger generation

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: High

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology; Chemistry; Drugs; Aging & Aging Control

Forecast: Pharmacologic reduction of the incidence of sudden cardiac death

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Eugene Braunwald, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects: Pharmacology

Forecast: U.S. availability of vaccines against specific gram-negative bacteria, including enterobacteria and pseudomonas species.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Stamma, Walter E., Stanly M. Martin, and John V. Bennett, "Epiderminology of Nosocomial Infections Due to Gram-Negative Bacilli: Aspects Relevant to Development and Use of Vaccines," The Journal of Infectious Diseases, Vol. 137, Supplement (August 1977), pp. S151 to S160.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Malignant neoplasm prevention by pharmacological means

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Cardiovascular disease control by chemical analysis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Prevention or adequate medical control of benign prostatic hyperplasia

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: John T. Grayhack, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 59

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Prevention or treatment of multiple sclerosis, perhaps by vaccine

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Fred Plum, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 58

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Vaccines against virus-related diseases

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Fritz H. Bach, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Immunization against hepatitis is perfected

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Wall Street Journal, 3/22/76, p. 19  
SCOUT Source Code 9779

Subject: Health, Health Care & Mental Health

Related Subjects: Medicine - Biomedicine

Forecast: Effective anticold vaccine

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerryold S. Maxmen

Reference: Maxmen, Jerryold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 276.

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Use of drugs or altered prenatal conditions to raise IQ of normal individuals by 10 to 20 points.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2015

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Moderate chemical control of senility

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 279.

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Development of economically useful mass-administered contraceptive agents

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 275

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

Forecast: Immunizing agents that protect against most viral agents available

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1975), p. 275

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Worldwide immunization against bacterial and viral diseases

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1993 - Bender and others  
1994 - Helmer and Gordon  
2009 - Smith, Kline, and French Laboratories

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source:

Reference: American Hospital Association, Hospitals in the 1980s  
(Waukegan, IL: Visual Images, Inc., 1977)

Subject: Medicine - Biomedicine

Related Subjects:

B. PREVENTIVE

3. Equipment

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Forecast: Malignant neoplasm prevention by electromagnetic means

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

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B. PREVENTIVE

4. Procedures

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C. THERAPEUTIC OR REHABILITATIVE

1. Techniques

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Forecast: Disease curing technologies permit more people to live longer.

Subforecasts: Does not affect maximum life span very much.

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Theodore Gordon

Reference: "Large Market Future for Conservation-Oriented Products and Services," Technology Forecasts & Technology Surveys, Vol. 9, No. 6 (June 1977), pp. 1-3.

Subject: Health, Health Care & Mental Health

Related Subjects:

**TFG President Predicts Mid-1980s Will Be Era of "Conspicuous Conservation"**

In the mid-1980s lifestyles in industrialized nations will be shaped by 4 key forces: the drive for conservation; inflation, changing incomes, and shifting demography; new technologies; and general acceptance of new values. This analysis of the not-too-distant future was recently presented to a Conference Board meeting by Theodore J. Gordon, president of The Futures Group. Gordon predicts that reducing energy consumption will result in decreased mobility, transition to electricity (including electric vehicles), and renewed emphasis on mass transit. Although the exact economic effect of the energy problem is uncertain, Gordon suggests that the mid-1980s will be an era of "conspicuous conservation." Perceptions about what constitutes the "good life" will change and views of what is desirable to consume will be altered. On the average, households will probably have more money to spend but there will be some basic shifts in the composition of spending units. Gordon anticipates that more emphasis will be placed on family and social problems and interests; inflation will lead to diminished incomes and more conservative lifestyles; some "necessities" will become luxuries; and the rate of formation of single-person households will decline because multiple-wage-earner households will enjoy economic advantages. Advanced electronics and medicine are 2 technologies that will have significant impacts on the future. Among the electronic advances will be household computers, smart machines or robots, electronic braking systems for cars, and interactive, 2-way TV games. In medicine, progress will be made in both disease curing and life extending technologies. All changes will be accompanied by intensified desires for entitlement and security.

Keywords: Energy conservation, Lifestyles, Technology

Forecast: Applications of recombinant DNA technology are evident during the period 1987-2025.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1987-2025

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Dr. Sheldon Krimsky

Reference: Krimsky, Sheldon, "Public Must Regulate Recombinant Research," Chemical & Engineering News (May 30, 1977), pp. 36-39.

Subject: Genetics - Eugenics - Reproduction

Related Subjects: Technology

### Some Far-Reaching Applications of DNA Research Only 10 to 15 Years Away

In 1976 a citizen board was established in Cambridge, Mass. to review the potential hazards of allowing a local laboratory facility to do recombinant DNA research. Dr. Sheldon Krimsky, of Tufts University, served on the Cambridge Experimentation Review Board (CERB) and stresses the right of communities to exclude genetic research if the public perceives that the risks outweigh the benefits. The arguments against recombinant DNA research fall into four categories, health hazards, species barriers, genetic engineering, and misplaced priorities. The Cambridge Review board focused on the potential health hazards. The NIH guidelines for introducing DNA technology were found lacking by CERB and they called upon Congress to provide uniform Federal guidelines encompassing all possible future uses of DNA technology in both research institutions and industry. Krimsky estimates that "some of the more far-reaching applications are estimated to be only 10 to 50 years away." Opponents see possible "baneful forms of genetic engineering occurring in the year 2050" as a result of recombinant DNA research in the 1970s.

Keywords: Genetic research, Regulation

Source: C&E News, 5/30/77, pp. 36-39

Serial No.: 3825

Forecast: Regeneration by restoration of embryonic capabilities

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

AD-A090 477

FUTURES GROUP, GLASTONBURY CT  
A STUDY TO DETERMINE THE EVOLUTION OF ADVANCES IN MEDICAL TECHN--ETC(U)  
MAY 00 T J GORDON, L MASON, H TRUITT

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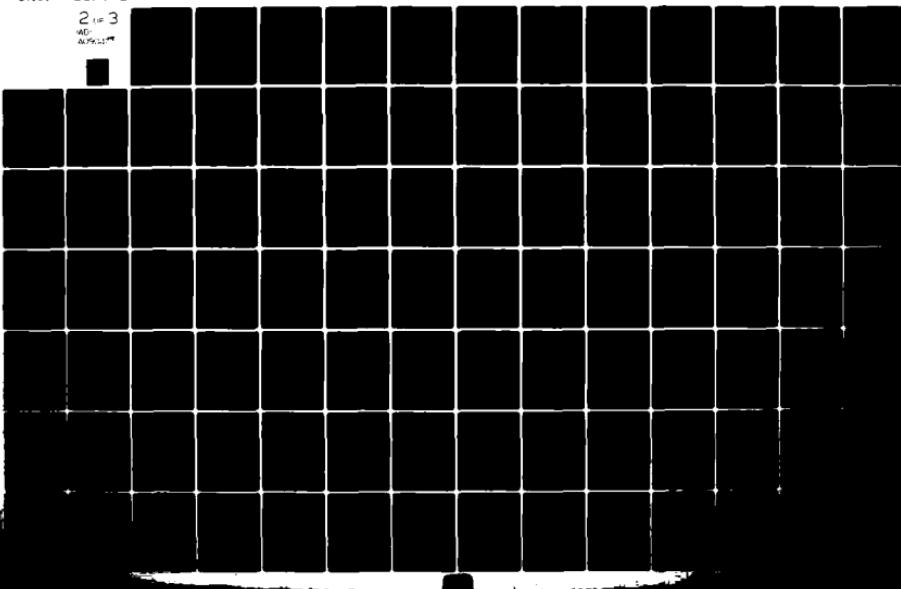
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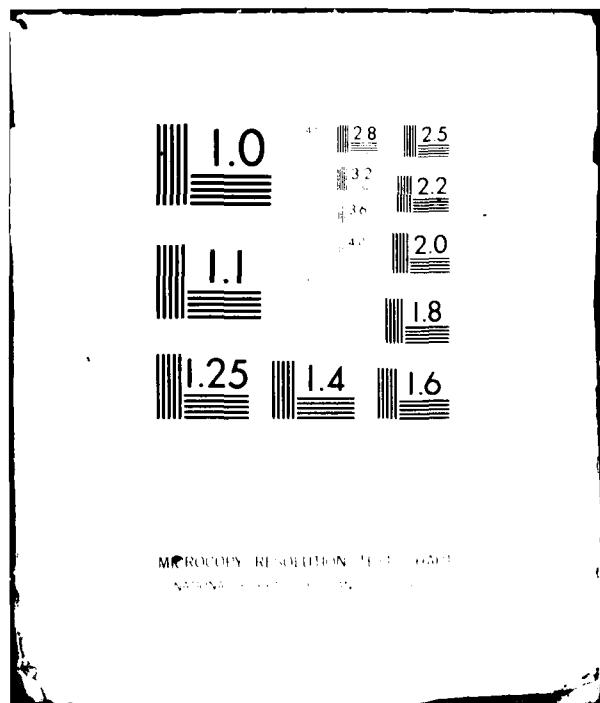
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MICROCOPY RESOLUTION TEST CARD

NATIONAL BUREAU OF STANDARDS

Forecast: Elucidation of malignant processes and effective cancer therapy

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: John B. Henry, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 58

Subject: Medicine - Biomedicine

Related Subject:

Forecast: Understanding the cellular and chemical basis of inherited disease, immunogenetics and its application to preventive medicine, enzyme replacement therapy, control of the immune reaction in organ transplants—all leading to increased ability to deal with heritable diseases

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: A. McGehee Harvey, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Effective immunotherapy of cancer

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Harold S. Ginsberg, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Treatment of infectious diseases on basis of molecular mechanisms of pathogenesis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Harold S. Ginsberg, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Manipulation of cellular immune reactions in organ transplantation, delayed hypersensitivity, autoimmune diseases, and suppression of fertility

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Fritz H. Bach, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Defects in single genes are repaired by putting a synthetic gene into human cells.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1988

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Bert W. O'Malley

Reference: Miller, Julie Ann, "Bacteria Copy Hormone- Controlled Gene," Science News, Vol. 113, No. 13 (April 1, 1978), p. 201.

Subject: Genetics - Eugenics - Reproduction

Related Subjects: Biology

#### Gene Repair May Be Possible Within 10 Years

Recombinant DNA researchers at Baylor College of Medicine report that they have achieved bacterial production of a hormone regulatable gene. They can extract, purify, and reproduce in bacteria a gene responsible for chicken egg production under control of steroid hormones. Researcher Bert W. O'Malley states that they are able to produce large quantities of the gene, which will permit scientists to study how hormones react with DNA to regulate production of life-sustaining substances. Thus, the availability of large quantities of genes will enhance the potential for developing gene therapy. O'Malley predicts that within a decade defects in single genes can be repaired by inserting a synthetic gene into human cells.

Keywords: Genetic research

Source: Sci News, 4/1/78, p. 201

Serial No.: 8096

Forecast: Hormonal defects are corrected by putting correct genes back into cells.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1988

Assumptions:

Probability: High

Method: Intuitive single individual expert in field

Source: Dr. Bert O'Malley

Reference: "Hormone-Controlled Gene Has Been Cloned," Chemical & Engineer News (March 20, 1978), p. 4.

Subject: Genetics - Eugenics - Reproduction

Related Subjects: Biology

New Cure for Hormonal Defects?

Scientists have succeeded in cloning a hormone-regulated gene, leading Dr. Bert O'Malley of Baylor College of Medicine in Houston to predict that within 10 years hormonal defects will be corrected by putting correct genes back into cells.

Keywords: Genetic research

Source: C&E News, 3/20/78, p. 4

Serial No.: 7934

C. THERAPEUTIC OR REHABILITATIVE

2. Drugs

Forecast: Availability of a sleep-inducing peptide (nine amino-acid chain isolated from B-endorphin chain).

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "A Natural Sleep Chemical," Science News, Vol. 111, No. 22 (May 28, 1977), p. 346.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Pharmacologic therapy for minimizing myocardial damage in the face of severe obstructive coronary artery disease

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Eugene Braunwald, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects: Pharmacology

Forecast: Recombinant DNA research yields commercial applications.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1982-1987

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: John Adams of Pharmaceutical Manufacturers Association

Reference: "DNA Research: No Federal Regulation Now," Chemical & Engineering News (November 21, 1977), p. 22.

Subject: Genetics-Eugenics-Reproduction

Related Subjects: Medicine-Biomedicine

**Commercial Applications of DNA  
Research Predicted in 5 to 10 years**

In the continuing dialogue concerning the need for the government to regulate DNA research, it was brought out that DNA researchers feel they are capable of overseeing themselves. These views, stated during Senate subcommittee hearings, met a relatively receptive audience. Most scientists in industry believe it will be approximately 5 years before recombinant DNA research yields any commercial applications. An official with the Pharmaceutical Manufacturers Association, John Adams, predicts the appearance of commercial utilizations in 5 to 10 years, whereas the head of infectious disease research at Upjohn Co., Dr Joseph E. Grady, forecasts the development of "marketable" products stemming from DNA work in "less than 5 years."

*Keywords: Genetic research, Regulation  
Source: C&E News, 11/21/77, p. 22  
Serial No.: 6491*

THIS PAGE IS EAST QUALITY PRACTICAL  
FROM OUR FAXED TO DDC

Forecast: Availability of synthetic beta-endorphins as analgesics

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1986

Assumptions: These are classified as non-narcotic analgesics

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "Synthetic 'Natura' Opiates Close at Hand?" New Scientist, Vol. 74, No. 1049 (April 28, 1977), p. 191.

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Effective cancer chemotherapeutic tools for prostate, bladder, and kidney

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: John T. Grayhack, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 59

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: More effective, less toxic anti-inflammatory agents

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Joseph L. Hollander, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 59

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Chemical treatment of malignant brain tumor

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Fred Plum, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 58

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Chemotherapy or chemoprophylaxis for viral diseases

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Harold S. Ginsberg, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Enzyme replacement therapy

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Kurt Hirschhorn, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Availability of a synthesized nonpeptide endogenous morphine-like compound.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1982

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Gintzler, Alan R., Michael D. Gershon, and Sydney Spector, "A Non-peptide Morphine-Like Compound: Immunocytochemical Localization in the Mouse Brain," Science, Vol. 199, No. 4327 (January 27, 1978), pp. 447-448.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of an effective single-dose drug regimen for penicillin resistant gonorrhea

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1984

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "Penicillin-Resistant Gonorrhea," Journal of the American Medical Association, Vol. 237, No. 10 (March 7, 1977), p. 950

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Drugs that limit heart damage during a heart attack are more widely used

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Wall Street Journal, 3/27/76, p. 19  
SCOUT Source Code 9779

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Development of drugs that alter memory and learning

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 278.

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Drugs to raise IQ of borderline retardates by 10 to 20 points

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 276

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of an effective anti-arrhythmic with no depressant effect on heart performance.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from "Michigan Investigators Test New Drug's Effects on Animal's Cardiac Arrhythmias," The NIH Record, Vol. 28, No. 17 (August 24, 1976), p. 6.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of topical nitroglycerin products which have a sustained vasodilator effect and can be used to treat ambulatory patients with congestive heart failure.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "Vasodilator Applied Cutaneously," Medical World News, Vol 17, No. 7 (April 5, 1976), p. 17.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of inexpensive treatment which allows penicillin-allergic patients to take the drug.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "New Therapy for Penicillin Allergy," Science News, Vol. 110, No. 4 (July 24, 1976), p. 55.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of oral mycophenolic acid as psoriasis treatment.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Weinstein, Gerald D., and Jerry L. McCullough, "Cytokinetics and Chemotherapy for Psoriasis," Journal of Investigative Dermatology, Vol. 67, No. 1 (July 1976), pp. 26-30.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Chemical treatment of gallstones

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 276

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Minoxidil, an experimental drug for reducing high blood pressure is also proven to be effective in improving blood circulation, enhancing blood flow to the skin, skeletal muscle, pancreas, stomach and large intestine.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: Sannerstedt, Rune, et.al., "Minoxidil: Haemodynamic and Clinical Experiences With a New Peripheral Vasodilator," Acta Medica Scandinavica, Vol. 197, No. 5 (May 1975), pp. 409-414.

Subject: Drugs

Related Subjects: Medicine ~ Biomedicine

Forecast: Availability of a cannabinoid analgesic less toxic than narcotic agents with no respiratory depression or dependence effects.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "Analgesic Researchers Move in for Kill Against Pain." Chemical Week, Vol. 116, No. 4 (January 22, 1975), pp. 39-40

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Availability of clinically effective antidepressants which do not cause an accumulation of norepinephrine at the adrenergic receptor sites of the brain, and are free from peripheral anticholinergic side effects.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by the Futures Group from: Berger, Frank M., "Depress and Antidepressant Drugs," Clinical Pharmacology and Therapeutics, Vol. 18 No. 3 (September 1975), pp. 241 - 248.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of improved beta-blocking agents less likely to cause bronchoconstriction.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Shand, David G., "Drug Therapy: Propranolol," The New England Journal of Medicine, Vol. 293, No. 6, (August 7, 1975) pp. 280-285.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of an orally effective anti-allergy agent (e.g., doxantrazole).

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Batchelor, J. F., "Doxantrazole, An Antiallergic Agent Orally Effective in Man," The Lancet, No. 7917 (May 24, 1975), pp. 1169-1170.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Successful treatment of childhood leukemia.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field.

Source:

Reference: Derived by The Futures Group from: "Big Gains Against Childhood Cancer," Medical World News, Vol. 16, No. 8 (April 21, 1975), p. 25.

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Widespread availability of a combination drug (mixture of an amino acid derivative and cycloserone, an antibiotic) which destroys all strains of disease-causing bacteria, including antibiotic-resistant strains.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "Nondiscriminating Drugs," Chemical Week, Vol. 117, No. 15 (October 8, 1975), p. 27.

Subject: Drugs

Related Subjects: Medicine - Biomedicine

30 Forecast: Availability of sustained - action dosage forms of hypotensives with low side effects

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Shand, David G., "Drug Therapy: Propranolol," The New England Journal of Medicine, Vol. 293, No. 6 (August 7, 1975), pp. 280-285

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Availability of safe and effective antibody/cytotoxic drug mixtures to act directly on tumor-associated antigens.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "New Cancer Treatment Method," Journal of American Medical Association, Vol. 235, No. 24 (June 14, 1976), p. 2647.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of chemotherapeutic agent to prevent herpes simplex recurrences by acting only on the viral DNA rather than the genetic material of the host.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Smith, Edgar B., "Management of Herpes Simplex Infections of the Skin," Journal of the American Medical Association, Vol. 235, No. 16 (April 19, 1976) pp. 1731-1733.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of an effective topical anti-androgen treatment for acne which is not systemically absorbed.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Lee, Peter A., "Acne and Serum Androgens During Puberty," Archives of Dermatology, Vol. 112 (April 1976), pp. 482-484.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of topical phosphonoacetic acid to inhibit herpesvirus replication and reduce vesicle formation.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "A Promising Acid," Medical World News, Vol. 17, No. 28 (December 27, 1976), p. 5.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of a pharmaceutical to block insulin receptors on fat cells.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by the Futures Group from: Bylinsky, Gene, "The Future Drugs That Will Be Lifesavers for the Industry, Too," Fortune, Vol. XCIV, No. 6, (December 1976), pp. 152-156, 150, 162.

Subject: Medicine - Biomedicine

Related Subjects: Health. Health Care & Mental Health

Forecast: Availability of a pharmaceutical with an endogenous-opiate base for use in sleep disorders and for tranquilization.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Belinsky, Gene, "Future Drugs That Will Be Lifesavers For The Industry Too," Fortune, Vol. XCIV, No. 6 (December 1976) pp. 152-156, 158, 162.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: For common cold and influenza interferon is applied in porous reservoirs and diffused locally into the upper respiratory tract.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Bylinsky, Gene, "Future Drugs That Will Be Lifesavers For The Industry, Too," Fortune, Vol. XCIV, No. 6 (December, 1976), pp. 152-156, 158, 162.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Availability of less expensive powder-form antacids which retain the reactivity of the liquid form and do not contain sodium

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Zaludek, Gloria, "Scientists Restructure Antacids," American Druggist, Vol. 173, No. 5 (May 1976), p. 73

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Penicillin derivatives (e.g., talampicillin and pivampicillin) available which are better absorbed than compounds available in 1976.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: High

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: Leigh, D. A. et. al., "Talampicillin: A New Derivative of Ampicillin," British Medical Journal No. 6022 (June 5, 1976), pp. 1378-1380.

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: A treatment combining clavulanic acid and penicillin inhibits beta-lactamase, leaving resistant bacteria once again susceptible to penicillin treatment

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source:

Reference: Derived by The Futures Group from: "Clavulanic Acid: An Important Development in the Penicillin Market," SCRIP, Issue 207 (May 29, 1976), p. 13.

Subject: Drugs

Related Subjects: Medicine - Biomedicine

Forecast: Use of drugs to raise intelligence level

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1989 - Helmer and Gordon  
2017 - Smith, Kline, and French Laboratories

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source:

Reference: American Hospital Association, Hospitals in the 1980s  
(Waukegan, IL: Visual Images, Inc., 1977)

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Chemical control over hereditary defects

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1998 - Bender and others  
2000 - Helmer and Gordon  
2009 - Smith, Kline, and French Laboratories

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source:

Reference: American Hospital Association, Hospitals in the 1980s (Waukegan, IL: Visual Images, Inc., 1977).

Subject: Medicare - Biomedicine

Related Subject: Drugs

Forecast: Chemical cure for schizophrenias

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Development of safe chemical means to reverse effects of arterio-sclerosis

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Development of effective broad spectrum antiviral agents

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277

Subject: Medicine - Biomedicine

Related Subjects: Drugs

Forecast: Moderate use of genetic engineering in humans by chemical substitution of DNA chains.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2020

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

C. THERAPEUTIC OR REHABILITATIVE

3. Equipment

Forecast: Non-biological gland or secretion prosthesis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Non-biological heart or bloodvessel prosthesis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: High

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Tissue regeneration using electromagnetic fields

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Completely computerized general health care centers for treatment of mass populations

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Jacob Kline, Ph.D.,

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

t Forecast: Clinical use of implantable artificial bladder, heart, kidneys, pancreas and liver

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Jacob Kline, Ph.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 56

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Artificial hearts are developed but developments in heart transplants reduce their importance.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2001

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Ben D. McCallister

Reference: "Midwest Research Institute: Focus on 2001," Technology Forecasts and Technology Surveys, Vol. 9, No. 10 (October 1977), pp. 1-3.

Subject: Medicine - Biomedicine

Related Subjects:

**Speakers Expect Many Changes by 2001**

Speakers at a special lecture series on the Midwest in 2001 forecast changes in population, medicine, and telecommunications. Garland R. Hadley, executive vice-president of Kent Foundation, stated that he expects the population of the Midcontinent region to grow more rapidly than the national population. He noted that productivity must increase faster than the population if we are to enjoy a rising standard of living. He concluded that "we may actually be entering a period in which further mechanization is no longer necessary for survival, but instead one in which technology becomes a neutral force. Thus we may be creating an environment conducive to the creation of small businesses and greater diversity in products and services." Ben D. McCallister, a cardiologist, predicted that the greatest advances in medicine from now until 2001 will involve biochemical and metabolic discoveries at the cellular level. He stated that artificial hearts may be developed by 2001, but that developments in heart transplants will reduce their importance. McCallister also forecasts construction of more specialized care centers and increased use of nurse clinicians and paramedics, in order to contain health care costs. Robert Gaynor, vice-president and general manager of AT&T Long Lines, predicted that computers will be invaluable business aids. For example, workers will be able to retrieve information from central data banks to help in decision making and will use computers to test the impact of various decisions. In discussing these and other advances in telecommunications, Gaynor explained that "the technology underlying these concepts exists today. They will be introduced as soon as the demand is there, when the marketplace is willing to pay for them."

Keywords: Computer, Demography, Medical care, Telecommunications

Sources: Tech F & Tech S, 10/77, pp. 1-3

Serial No.: 6197

Forecast: Non-biological muscle prosthesis

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977).

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Tiny TV camera implanted in an eye socket used in conjunction with a microprocessor, transmitters, and receivers compressed into the stems of spectacles allows blind persons to see.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Consensus forecast face to face

Source:

Reference: "Era of Bionic Person Moves Nearer to Reality," U.S. News & World Report (March 13, 1978), pp. 60-61, Scout Abstracts Serial No. 7745

Subject: Medicine - Biomedicine

Related Subjects: Biology, Science

### Era of Bionic Person Draws Nearer

Medical engineering is making rapid progress in the development of electronic aids for the handicapped. The devices, which take advantage of advances in microcircuitry, also have the potential of extending the powers of the able-bodied. Implantation of sensors in deaf people holds promise of bypassing non-functioning nerves. In the meantime, the deaf will benefit from redesigned, more selective hearing aids. The blind are given the promise of sight, as microprocessors and mini-camera's are developed into systems that relay sensory data to the proper section of their brains or transmit other impulses they can be trained to interpret. Artificial organs, muscles, and spinal cords are all receiving extensive research. Neuron bionics is a new area of research seeking to increase the brain's power by linking it to a computer; a major problem is deciphering the brain's language.

Keywords: Medical research

Source: US News, 3/13/78, pp. 60-61

Serial No.: 7745

Forecast: It is possible to build electrical bridges over damaged parts of central nervous systems of paralyzed persons

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1993

Assumptions:

Probability: Medium

Method: Consensus forecast face to face

Source: Veterans Administration

Reference: "Era of Bionic Person Moves Nearer to Reality," U.S. News & World Report (March 13, 1978), pp. 60-61, Scout Abstracts Serial No. 7745

Subject: Medicine - Biomedicine

Related Subjects: Biology, Science

### Era of Bionic Person Draws Nearer

Medical engineering is making rapid progress in the development of electronic aids for the handicapped. The devices, which take advantage of advances in microcircuitry, also have the potential of extending the powers of the able-bodied. Implantation of sensors in deaf people holds promise of bypassing non-functioning nerves. In the meantime, the deaf will benefit from redesigned, more selective hearing aids. The blind are given the promise of sight, as microprocessors and mini-camera's are developed into systems that relay sensory data to the proper section of their brains or transmit other impulses they can be trained to interpret. Artificial organs, muscles, and spinal cords are all receiving extensive research. Neuron bionics is a new area of research seeking to increase the brain's power by linking it to a computer; a major problem is deciphering the brain's language.

Keywords: Medical research

Source: US News, 3/13/78, pp. 60-61

Serial No.: 7745

Forecast: General availability of computers to conduct psychotherapy

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 278.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Computer-controlled electronic devices, implanted in the brain, transmit video-like images of the outside world allowing blind persons to "see"

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: High

Method: Trend forecast intuitive extrapolation

Source:

Reference: Wall Street Journal, 3/22/76, p. 19  
SCOUT Source Code 9779

Subject: Science

Related Subjects: Technology

Forecast: Effective transplantation of all organ systems except for central nervous system

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 279.

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Artificial heart implantation

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 275

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Implanted artificial organs made of plastic and/or electronic components

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1983 - Bender and others  
1982 - Helmer and Gordon  
1985 - Smith, Kline, and French Laboratories

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source:

Reference: American Hospital Association, Hospitals in the 1980s  
(Waukegan, IL: Visual Images, Inc., 1977)

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Development of artificial colon

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Electrical control of mood disorders available.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2020

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Nationwide automated continuous clinical feedback to allow for perpetual updating of computer-rendered medical decisions.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2020

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Wide use of interactive television and phonovision for psychotherapy, greatly diminishing need for out-patient psychiatric clinics.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2010

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S.; The Post-Physician Era: Medicine in the Twenty First Century (New York: John Wiley & Sons, 1976), p. 280.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Wide use of artificial insemination to produce genetically superior offspring.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2010

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era in the Twenty-First Century (New York: John Wiley & Sons, 1970).

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

C. THERAPEUTIC OR REHABILITATIVE

4. Procedures

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Forecast: Heart or blood vessel transplantation

Subforecasts: Microsurgery in brain, sense organs, heart, or kidney

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

F  
S  
V  
M  
D

Forecast: Gland transplantation

Subforecasts: Lymph tissue transplants for improved infection control

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Organ transplantation to correct genetic diseases

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: Kurt Hirschhorn, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 57

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

Forecast: Reliable renal transplantation with cadaver kidneys

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source: John T. Grayhack, M.D.

Reference: "Medicine 2000," Medical World News (January 24, 1977), p. 59

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Bone or joint transplantation

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Consensus Forecast Delphi

Source:

Reference: National Science Foundation, A Technology Assessment of Life-Extending Technologies: Supplementary Report, Vol. 4 (Glastonbury, CT: The Futures Group, 1977)

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Replacement of human organs with those derived from specialty bred animals.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2015

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Laboratory demonstration of biochemical processes that stimulate growth of new organs and limbs.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2015

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects: Biology

Forecast: Laboratory demonstration of regeneration or repair of destroyed neurons.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 279.

Subject: Medicine - Biomedicine

Related Subjects: Physiology

Forecast: In vivo renewal of worn-out hearts by stimulating natural growth processes.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2010

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 280).

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Laboratory solution of immunologic rejection problem

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 275

Subject: Medicine - Biomedicine

Related Subjects: Drugs

D. ORGANIZATIONAL

1. Techniques

Forecast: AMA is bargaining agent between doctors and government during the period 1980-1990.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Trend forecast intuitive extrapolation

Source:

Reference: "America's Doctors: A Profession in Trouble," U.S. News & World Report (October 17, 1977), pp. 50ff.

Subject: Health, Health Care & Mental Health

Related Subjects: Medicine - Biomedicine

**Medical Profession Seen Changing Over Next Decade**

A *US News & World Report* special report suggests that the next few years will be critical to the future of the US medical profession. The highest doctor patient ratio, since the turn of the century, 1 to 490, will exist in 1980. According to estimates by government officials, physicians will earn an average of \$75,000 annually by 1978. More than 31 million Americans will be over 65 by the year 2000; they will require 2.5 times as much health care as younger citizens and specialities are not geared to meet the demand. High costs, technology, quality, and the conflict of the individual versus society are problem areas requiring some solution in the future. HEW Secretary Califano identifies high cost as the "overarching problem": expenditures will double by 1980; hospital costs for medicare and medicaid will double sooner, hospital costs could reach \$200 billion by 1985; health costs are increasing 1.5 times the cost of living increase. Health officials and physicians identify the following trends over next decade: public scrutiny and efforts to unionize doctors will further chip at the medical "mystique"; the AMA will be the bargaining agent between doctors and government; medical economics will change, the FTC will challenge the current laissez-faire approach; greater use of paraprofessionals; less specialization; and a change to more preventive medicine programs that stress diet and behavior.

Keywords: Health care costs, Medical care,

Physicians

Source: *US News*, 10/17/77, pp. 50ff

Serial No.: 3869

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Forecast: Public scrutiny and efforts to unionize doctors further chips at the medical mystique during the period 1980-1990.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Trend forecast intuitive extrapolation

Source:

Reference: "America's Doctors; A Profession in Trouble," U.S. News & World Report (October 17, 1977), pp. 50ff.

Subject: Health, Health Care & Mental Health

Related Subjects: Medicine - Biomedicine

**Medical Profession Seen Changing Over Next Decade**

A US News & World Report special report suggests that the next few years will be critical to the future of the US medical profession. The highest doctor patient-ratio, since the turn of the century, 1 to 490, will exist in 1980. According to estimates by government officials, physicians will earn an average of \$75,000 annually by 1978. More than 31 million Americans will be over 65 by the year 2000; they will require 2.5 times as much health care as younger citizens and specialities are not geared to meet the demand. High costs, technology, quality, and the conflict of the individual versus society are problem areas requiring some solution in the future. HEW Secretary Califano identifies high cost as the "overarching problem"; expenditures will double by 1980; hospital costs for medicare and medicaid will double sooner, hospital costs could reach \$220 billion by 1985; health costs are increasing 1.5 times the cost of living increase. Health officials and physicians identify the following trends over next decade: public scrutiny and efforts to unionize doctors will further chip at the medical "mystique"; the AMA will be the bargaining agent between doctors and government; medical economics will change, the FTC will challenge the current laissez-faire approach; greater use of paraprofessionals; less specialization; and a change to more preventive medicine programs that stress diet and behavior.

*Keywords:* Health care costs, Medical care,

Physicians

*Source:* US News 10/17/77, pp 50ff

*Serial No.* 5869

Forecast: The health manpower crisis in rural areas is regarded as solved.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1987

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Robert D. Graham, M.D.

Reference: "Manpower Crisis in Rural Areas to be Over Within Ten Years, HEW Official Predicts," Hospitals, Vol. 51, No. 10 (May 16, 1977), p. 18.

Subject: Health, Health Care & Mental Health

Related Subjects:

**HEW Official Predicts End to Manpowor Crisis  
in Rural Areas Within 10 Years**

Robert Graham, deputy director of HEW's Bureau of Health Manpower, believes that within 10 years the health manpower crisis in rural areas will be regarded as solved. Recently more and more younger practitioners have been going into rural areas. Health professionals are not as reluctant to practice in rural areas as previously.

*Keywords: Medical care, Physicians*

*Source: Hospitals, 5/16/77, p. 18*

*Serial No.: 3839*

Forecast: Federal regulation of all phases of medicine, including pathology, grows

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: High

Method: Consensus forecast Delphi

Source:

Reference: Goodale, Fairfield, and George W. Gander, "The Future of Pathology: A Delphi Study by Pathology Department Chairmen," College of American Pathologists (January 1977), p. 14.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Increasing subspecialization in clinical pathology

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: High

Method: Consensus forecast Delphi

Source:

Reference: Goodale, Fairfield, and George W. Gander, "The Future of Pathology: A Delphi Study by Pathology Department Chairmen," College of American Pathologists (January 1977), p. 14.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Curtailment in the number of approved residency training programs in pathology

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: High

Method: Consensus forecast Delphi

Source:

Reference: Goodale, Fairfield, and George W. Gander, "The Future of Pathology: A Delphi Study by Pathology Department Chairmen," College of American Pathologists (January 1977), p- 14.

Subject: Medicine - Biomedicine

Related Subjects:

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Forecast: Increasing subspecialization in anatomic pathology

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: High

Method: Consensus forecast Delphi

Source:

: Reference: Goodale, Fairfield, and George W. Gander, "The Future of Pathology: A Delphi Study by Pathology Department Chairmen," College of American Pathologists (January 1977), p. 14.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Residency training programs confined to university hospitals and their affiliate hospitals

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: High

Method: Consensus forecast Delphi

Source:

Reference: Goodale, Fairfield, and George W. Gander, "The Future of Pathology: A Delphi Study by Pathology Department Chairmen," College of American Pathologists (January 1977), p. 14.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: National registry of cancer-prone families in the United States is compiled

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Wall Street Journal, 3/22/76, p. 19  
SCOUT Source Code 9779

Subject: Medicine - Biomedicine

Related Subjects:

D. ORGANIZATIONAL

2. Drugs

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Forecast: There are standard prescription packs containing medication for typical therapeutic regimens available in the United States

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: High

Method: Trend forecast intuitive extrapolation

Source:

Reference: Medical Marketing & Media, 4/76, p. 42  
SCOUT Source Code 10100

Subject: Pharmacology

Related Subjects: Medicine - Biomedicine

Forecast: Use of highly complex chemical simulation models of the human body for use in drug experimentation.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2010

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 280.

Subject: Medicine - Biomedicine

Related Subjects: Drugs

D. ORGANIZATIONAL

3. Equipment

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FUTURES GROUP GLASTONBURY CT  
A STUDY TO DETERMINE THE EVOLUTION OF ADVANCES IN MEDICAL TECHN--ETC(U)  
MAY 80 T J GORDON, L MASON, H TRUITT  
UNCLASSIFIED 448-103-05/05

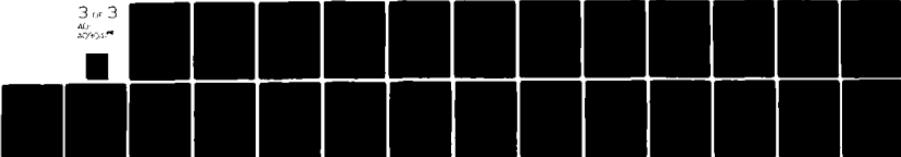
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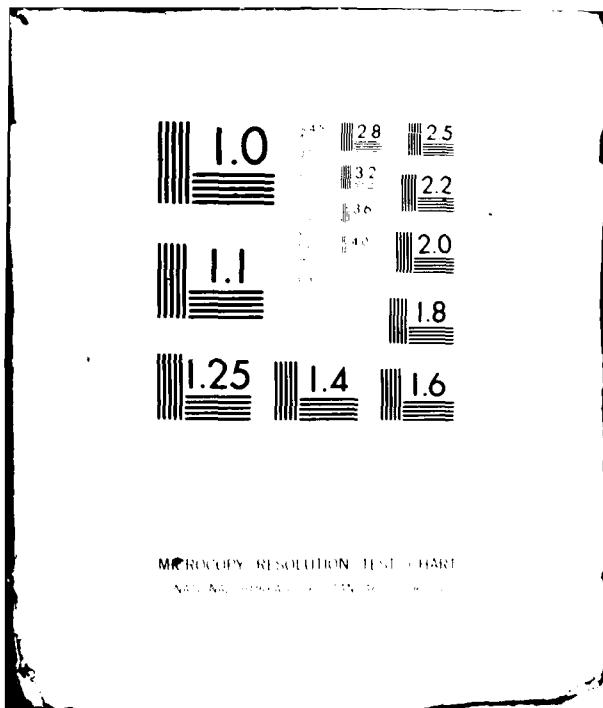
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963

Forecast: Government established standards for medical computers exist

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 275

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Demonstration of man-machine symbiosis, enabling a person to extend his intelligence by direct electromechanical interaction between his brain and a computer.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2015

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Medico-legal information available via interactive television

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Medical records of 80 percent of U.S. population stored in national medical data bank

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: First experimental use of computers for all diagnostic and treatment decisions in patient care

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1995

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold A. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 279.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: "Telemedicine" services widely delivered in homes.

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2015

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 281.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: A North American computer-based medical record bank covers 80 percent of the population and gives accurate access to full medical records.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1987

Assumptions:

Probability: Medium

Method: Trend forecast mathematical extrapolation

Source:

Reference: Canadian Medical Association Journal, 12/31/75, p. 1076.  
SCOUT Source Code 8475

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: In most North American cities, teams of doctors and nurses make emergency housecalls with computer-controlled mobile laboratories.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Canadian Medical Association Journal, 12/13/75, p. 1076.  
SCOUT Source Code 8475

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

D. ORGANIZATIONAL

4. Procedures

E. SUPPORTIVE

1. Techniques

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Forecast: The paramedic and the computer create a "post-physician era."

Subforecasts: The medic does the routine and human interest work and the computer does all the technical tasks.

Year Forecast Made: 1977

Year of Occurrence: 2025

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold Maxmen

Reference: Dooley, Ann, "Rx for DP's Future in Medicine: Aid or Substitute for Doctors?" Computerworld (June 20, 1977), p. 24.

Subject: Computers

Related Subjects: Medicine - Biomedicine

#### Professor Predicts Doctors Will Be Obsolete in 50 Years

Jerrold Maxmen, assistant professor of psychiatry at Albert Einstein College of Medicine, believes that in 50 years there will be a "post-physician era" with computers making diagnoses and medical decisions while paramedics perform routine tasks and take care of any human interaction necessary. In the 21st century, computers will be commonplace and, Maxmen states, they will provide the last word medical care with malpractice suits resulting when computers are not consulted. A benefit from this computer takeover would be the decreased training time for paramedics (12 to 18 months) as compared to 8 to 10 years required of today's doctors. The director of computer systems in medicine of the AMA, David Harris, disagrees with Maxmen. He sees computers as an enhancement to medical care not as replacements for doctors.

Keywords: Computers, Physicians  
 Source: Compworld, 6/20/77, p. 24  
 Serial No.: 4184

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Forecast: The United States spends 50 percent of GNP on health.

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 2007

Assumptions: Current spending trends continue at the same rate.

Probability: High

Method: System in motion - existing schedule

Source:

Reference: Hospitals (July 16, 1977), p. 36.

Subject: Health, Health Care & Mental Health

Related Subjects:

**Health System of the Future**

The continuation of current spending trends over the next 30 years will lead to a situation in which the US will spend 50% of GNP on health care. Existing Medicare and Medicaid programs will result in a US medical system that is privately owned and publicly financed. These predictions are found in a book, *Health Services: The Local Perspective*, that hypothesizes that current local level experimentation will shape the health care system of the future.

*Keywords:* Medical care

*Source:* Hospitals, 7/16/77, p. 36

*Serial No.:* 4796

Forecast: Federal funding for health care increases at the expense of federal funds for research

Subforecasts:

Year Forecast Made: 1977

Year of Occurrence: 1995

Assumptions:

Probability: High

Method: Consensus forecast Delphi

Source:

Reference: Goodale, Fairfield, and George W. Gander, "The Future of Pathology: A Delphi Study by Pathology Department Chairmen," College of American Pathologists (January 1977), p. 14.

Subject: Medicine - Biomedicine

Related Subjects:

Forecast: Health care expenditures in the U.S. reach \$463.0 billion  
(1976 = \$144 billion; 1963 = \$33.6 billion)

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Trend forecast mathematical extrapolation

Source:

Reference: "Growth Seen in Electronic Patient Care Systems and Energy-Saving Markets," Technology Forecasts & Technology Surveys (March 1978), pp. 5-6.

Subject: Health, Health Care & Mental Health

Related Subjects: Technology

**Growth Forecast for Biomedical Electronic Patient Care Equipment Market**

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Predicasts Inc predicts that sales of biomedical electronic patient care systems will grow at an 11.2% annual rate through 1990. Since such systems help to minimize the impact of the medical personnel shortage and increase productivity, the market for them should be good despite pressures to limit hospital spending. Projected growth rates for specific categories are 10.7% for diagnostic equipment, 9.6% for therapeutic equipment, 10.3% for monitoring equipment, and 12.9% for electronic data processing. The study forecasts sales totaling \$7.2 billion in 1990, with EDP accounting for \$2.64 billion. Particularly promising products include pain control equipment, omnidiagrams, artificial hearts, cardiac assist devices and echocardiographs, electronic limbs, thermographic equipment, and peritoneal dialysis equipment. The study concludes that "opportunities for manufacturers are almost unlimited," since foreign demand can be exploited even if the saturation point is reached in the domestic market.

Keywords: Medical equipment

Source: Tech F & Tech S, 3/78, pp. 5-6

Serial No.: 8068

Forecast: The U.S. government spends \$19.5 million on research of 6 tropical diseases including malaria, leprosy, schistosomiasis, filariasis, trypanosomiasis, and leishmaniasis.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1984

Assumptions:

Probability: High

Method: System in motion—existing schedule

Source:

Reference: "Tropical Disease Research," Science Trends (February 20, 1978), p. 97.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

### Tropical Disease Research Spending

The US government will spend \$19.5 million by 1984 on research of 6 tropical diseases including malaria, leprosy, schistosomiasis, filariasis, trypanosomiasis, and leishmaniasis.

Keywords: Diseases, Medical research

Source: Sci Trends, 2/20/78, p. 97

Serial No.: 7541

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Forecast: Approximately three quarters of the American people have "catastrophic illness insurance" (1978 = less than 60 percent)

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1983

Assumptions:

Probability: High

Method: Intuitive single individual expert in field

Source: Peter F. Drucker

Reference: Drucker, Peter F., "The Future Shape of Health Care," The Wall Street Journal (July 19, 1978), p. 12.

Subject: Health, Health Care & Mental Health

Related Subjects:

Forecast: Expenses for corrective glasses, hearing aids and dentures are insured for the majority of Americans

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1990

Assumptions:

Probability: High

Method: Intuitive single individual expert in field

Source: Peter F. Drucker

Reference: Drucker, Peter F., "The Future Shape of Health Care," The Wall Street Journal (July 19, 1978), p. 12.

Subject: Health, Health Care & Mental Health

Related Subjects:

Forecast: Ninety percent of medical costs are covered by national health insurance

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era; Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 275

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Physicians in North America undergo compulsory reexamination and relicensing.

Subforecasts:

Year Forecast Made: 1975

Year of Occurrence: 1984

Assumptions:

Probability: Medium

Method: Trend forecast intuitive extrapolation

Source:

Reference: Canadian Medical Association Journal, 12/13/75, p. 1076.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

E. SUPPORTIVE

2. Drugs

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E. SUPPORTIVE

3. Equipment

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Forecast: Processing medical claims is almost totally computerized.

Subforecasts:

Year Forecast Made: 1978

Year of Occurrence: 1985

Assumptions:

Probability: Medium

Method: Trend forecast mathematical extrapolation

Source:

Reference: "Rising Medical Claims Processing" Technology Forecasts & Technology Surveys (January 1978), pp. 3-4.

Subject: Medicine-Biomedicine

Related Subjects:

**3.44 Billion Medical Claims Will Be  
Processed Annually by 1985**

A Frost & Sullivan study predicts that 3.44 billion medical claims will be processed annually by 1985 at a cost of \$24.5 billion (1975 cost = \$3.25 billion for 1.7 billion claims). New government regulations to minimize fraud, which will double the cost of processing claims, will be partially responsible for the increase. The analysis states that processing will probably be almost totally computerized by 1985 and that the physicians' share of the market for minicomputer and word processing hardware may "easily reach \$1.25 billion." The report also notes that there is a large market for the information obtained through claims processing. Pharmaceutical companies, medical equipment and supply companies, health planners, insurance companies, and the government are potential users of the data. The information could also "be used to support socioeconomic research on health delivery services." Dental claims processing is a related area with great future potential for computerization, according to the report.

Keywords: Computers, Medical care

Source: Tech F & Tech S, 1/78, pp. 3-4

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Forecast: Failure to consult a computer considered grounds for malpractice suit

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1990

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 277.

Subject: Medicine - Biomedicine

Related Subjects: Health, Health Care & Mental Health

Forecast: Robots with sensory feedback performing routine household chores in hospitals

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 2000

Assumptions:

Probability: Medium

Method: Intuitive single individual expert in field

Source: Jerrold S. Maxmen

Reference: Maxmen, Jerrold S., The Post-Physician Era: Medicine in the Twenty-First Century (New York: John Wiley & Sons, 1976), p. 279.

Subject: Medicine - Biomedicine

Related Subjects:

E. SUPPORTIVE

4. Procedures

Forecast: Creation of primitive life form

Subforecasts:

Year Forecast Made: 1976

Year of Occurrence: 1989 - Helmer and Gordon  
2017 - Smith, Kline, and French Laboratories

Assumptions:

Probability: Medium

Method: Consensus forecast Delphi

Source:

Reference: American Hospital Association, Hospitals in the 1980s  
(Waukegan, IL: Visual Images, Inc., 1977).

Subject: Medicine - Biomedicine

Related Subjects: Genetics - Eugenics - Reproduction

